WHAT IS THE RELATIONSHIP BETWEEN DIETARY PATTERNS CONSUMED AND BONE HEALTH?: SYSTEMATIC REVIEW PROTOCOL

This document describes the protocol for a systematic review to answer the following question: What is the relationship between dietary patterns consumed and bone health?

The 2020 Dietary Guidelines Advisory Committee, Dietary Patterns Subcommittee, answered this question by conducting a systematic review with support from USDA's Nutrition Evidence Systematic Review (NESR), part of which involved updating an existing NESR systematic review.

NESR methodology for answering a systematic review question involves:

- searching for and selecting articles,
- extracting data and assessing the risk of bias of results from each included article,
- synthesizing the evidence,
- developing a conclusion statement,
- grading the evidence underlying the conclusion statement, and
- recommending future research.

More information about NESR's systematic review methodology, used in this systematic review update, is available on the NESR website: https://nesr.usda.gov/2020-dietary-guidelines-advisory-committee-systematic-reviews.

This protocol is up-to-date as of: 4/20/2020.

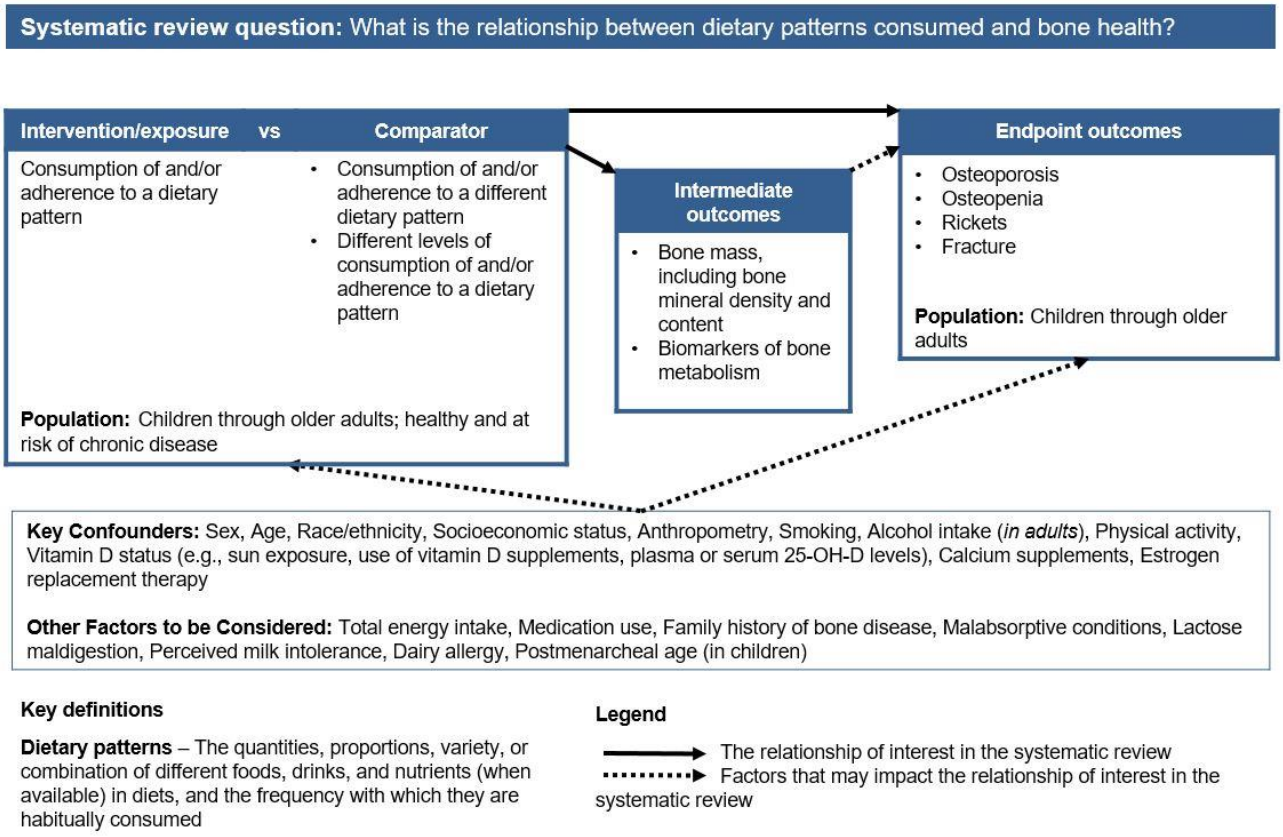
This document reflects the protocol as it was implemented. It now includes the electronic databases and search terms, and literature search and screening results, including a list of included articles, and a list of excluded articles with the rationale for exclusion.

This document includes details about the methodology as it was applied to the systematic review:

ANALYTIC FRAMEWORK

The analytic framework (**Figure 1**) illustrates the overall scope of the systematic review, including the population, the interventions and/or exposures, comparators, and outcomes of interest. It also includes definitions of key terms and identifies key confounders and other factors that were considered in the systematic review. The inclusion and exclusion criteria that follow provide additional information about how parts of the analytic framework are defined and operationalized for the review.

Figure 1: Analytic framework



LITERATURE SEARCH AND SCREENING PLAN

This table provides the inclusion and exclusion criteria for the systematic review. The inclusion and exclusion criteria are a set of characteristics used to determine which articles identified in the literature search were included in or excluded from the systematic review.

Table 1. Inclusion and exclusion criteria

Category	Inclusion Criteria	Exclusion Criteria
Study design	• Randomized controlled trials • Non-randomized controlled trials, including quasi-experimental and controlled before and after studies • Prospective cohort studies • Retrospective cohort studies • Nested case-control studies	• Uncontrolled trials • Cross-sectional studies • Uncontrolled before-and-after studies • Case-control studies • Narrative reviews • Systematic reviews • Meta-analyses
Intervention/ exposure	• Studies that examine consumption of and/or adherence to a dietary pattern (such as Dietary Approaches to Stop Hypertension (DASH), vegetarian/vegan, low-carbohydrate, and high-fat diets) • Dietary patterns may be measured or derived using a variety of approaches, such as adherence to a priori patterns (indices/scores), data driven patterns (factor or cluster analysis), reduced rank regression, or other methods, including clinical trials • Studies must describe the dietary pattern being tested or examined, including, at a minimum, the foods and beverages in the pattern	• Studies that do not provide a description of the dietary pattern, which at minimum, must include the foods and beverages in the pattern • This includes studies that examine a labeled dietary pattern, but do not describe the foods and beverages consumed, as well as those patterns that are based solely on nutrients
Comparator	• Consumption of and/or adherence to a different dietary pattern • Different levels of consumption of and/or adherence to a dietary pattern	• N/A
	• Studies that examine adherence to and/or or consumption of a different macronutrient proportion diet	

Category	Inclusion Criteria	Exclusion Criteria

Outcomes[i]	Intermediate Outcomes (only in randomized and non-randomized controlled trials; children ages 2-18 years):
	• Bone mass including:
	  ○ Bone mineral density
	  ○ Bone mineral content
	• Biomarkers of bone metabolism
	Endpoint outcomes (all study designs and age groups):
	• Osteoporosis
	• Osteopenia
	• Rickets
	• Fracture	

Date of publication	January 2014 – November 2019	Articles published prior to January 2014 or after November 2019
Publication status	Articles that have been peer-reviewed	Articles that have not been peer-reviewed and are not published in peer-reviewed journals (e.g., unpublished data, manuscripts, reports, abstracts, pre-prints, and conference proceedings)
Language of publication	Articles published in English	Articles published in languages other than English
Country[ii]	Studies conducted in countries ranked as high or higher human development	Studies conducted in countries ranked as medium or lower human development

[i] Intermediate outcomes were included for all study designs in children and intervention studies in adults.
[ii] The Human Development classification was based on the Human Development Index (HDI) ranking from the year the study intervention occurred or data were collected (UN Development Program. HDI 1990-2017 HDRO calculations based on data from UNDESA (2017a), UNESCO Institute for Statistics (2018), United Nations Statistics Division (2018b), World Bank (2018b), Barro and Lee (2016) and IMF (2018). Available from: http://hdr.undp.org/en/data). If the study did not report the year in which the intervention occurred or data were collected, the HDI classification for the year of publication was applied. HDI values are available from 1980, and then from 1990 to present. If a study was conducted prior to 1990, the HDI classification from 1990 was applied. If a study was conducted in 2018 or 2019, the most current HDI classification was applied. When a country was not included in the HDI ranking, the current country classification from the World Bank was used instead (The World Bank. World Bank country and lending groups. Available from: https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world- country-and-lending-groups).

Category	Inclusion Criteria	Exclusion Criteria
Study participants	• Human participants • Males • Females • Women during pregnancy and lactation	• Non-human participants (i.e., animals)

Age of study participants	• Age at intervention or exposure:
	  ○ Children and adolescents (ages 2-18 years)
	  ○ Adults (ages 19-64 years)
	  ○ Older adults (ages 65 years and older)
		• Age at intervention or exposure:
		  ○ Infants and toddlers (birth to 24 months)

	• Age at outcome:
	  ○ Children and adolescents (ages 2-18 years)
	  ○ Adults (ages 19-64 years)
	  ○ Older adults (ages 65 years and older)
		• Age at outcome
		  ○ Infants and toddlers (birth to 24 months)

Health status of study participants	• Studies that enroll participants who are healthy and/or at risk for chronic disease, including those with obesity
	• Studies that enroll ***some*** participants diagnosed with a disease
	  ○ Studies that enroll some participants diagnosed with low bone mineral density, low bone mineral content, osteoporosis, osteopenia, rickets, and fracture
		• Studies that ***exclusively*** enroll participants diagnosed with a disease or hospitalized with an illness or injury. (For this criterion, studies that exclusively enroll subjects with obesity will be included.)
		  ○ Studies that ***exclusively*** enroll participants with osteoporosis, osteopenia, rickets, and fracture (i.e., studies that aim to treat participants who have already been diagnosed with the outcome of interest)

Study duration	• Minimum length of intervention of 12 weeks	• Interventions less than 12 weeks
Size of study groups	• 30 participants per-arm in interventions, or a power calculation included • Sample size of 1000 or greater in observational studies	• Fewer than 30 participants per arm, or • No power calculation reported • Fewer than 1000 participants in observational studies

Electronic databases and search strategy

Listed below are the databases searched to identify all potentially relevant articles that have been published to address the systematic review question.

Database: PubMed
Provider: U.S. National Library of Medicine
Date(s) Searched: November 15, 2019
Date range searched: January 1, 2014 - November 15, 2019

(((((dietary pattern* OR diet pattern* OR eating pattern* OR food pattern* OR diet quality* OR eating habit* OR dietary habit* OR diet habit* OR food habit* OR beverage habit* OR "Feeding Behavior"[Mesh:NoExp] OR dietary profile* OR food profile* OR diet profile* OR eating profile* OR dietary guideline* OR dietary recommendation* OR dietary intake* OR eating style* OR "Diet, Mediterranean"[Mesh] OR Mediterranean Diet*[tiab] OR "Dietary Approaches To Stop Hypertension"[Mesh] OR Dietary Approaches To Stop Hypertension Diet* OR DASH diet* OR "Diet, Gluten-Free"[Mesh] OR Gluten Free diet* OR prudent diet* OR "Diet, Paleolithic"[Mesh] OR Paleolithic Diet* OR "Diet, Vegetarian"[Mesh] OR vegetarian diet*[tiab] OR vegan diet* OR "Healthy Diet"[Mesh] OR plant based diet* OR "Diet, Western"[Mesh] OR western diet* OR "Diet, Carbohydrate-Restricted"[Mesh] OR low-carbohydrate diet* OR high carbohydrate diet* OR Ketogenic Diet* OR Nordic Diet* OR "Diet, Fat-Restricted"[Mesh] OR "Diet, High-Fat"[Mesh] OR "Diet, High-Protein"[Mesh] OR high protein diet*[tiab] OR protein intake* OR high-fat diet* OR low fat diet* OR "Diet, Protein-Restricted"[Mesh] OR low protein diet* OR "Diet, Sodium-Restricted"[Mesh] OR low-sodium diet* OR low salt diet* OR (("Dietary Proteins"[Mesh] OR dietary protein*[tiab] OR "Dietary Carbohydrates"[Mesh] OR dietary carbohydrate*[tiab] OR "Dietary Fats"[Mesh] OR dietary fat*[tiab] OR hypocaloric OR hypo-caloric) AND (diet[tiab] OR diets[tiab] OR consumption[tiab] OR intake[tiab] OR supplement*[tiab])) OR (“Guideline Adherence"[Mesh] AND (diet[tiab] OR dietary[tiab] OR food[tiab] OR beverage*[tiab] OR nutrition*[tiab])) OR diet score* OR diet quality score* OR diet quality index* OR kidmed OR diet index* OR dietary index* OR food score* OR MedDietScore OR healthy eating index[tiab] OR ((pattern[tiab] OR patterns[tiab] OR consumption[tiab] OR habit*[tiab]) AND (“Diet"[Mesh:NoExp] OR diet[tiab] OR diets[tiab] OR dietary[tiab] OR "Food"[Mesh] OR food[tiab] OR foods[tiab] OR "Beverages"[Mesh] OR beverage[tiab] OR beverages[tiab])))) AND ("Bone Density"[Mesh] OR “bone density”[tiab] OR bone mineral density[tiab] OR "Bone Development"[Mesh] OR “bone development"[tiab] OR "Fractures, Bone"[Mesh] OR bone fracture*[tiab] OR "Bone Diseases"[Mesh] OR bone disease*[tiab] OR bone turnover[tiab] OR bone loss[tiab] OR osteoporosis[tiab] OR “Osteoporosis”[Mesh] OR osteopen*[tiab] OR osteitis[tiab] OR "Rickets"[Mesh] OR Rickets[tiab] OR bone mineral*[tiab] OR “bone mass”[tiab] OR bone health*[tiab] OR "Bone Demineralization, Pathologic"[Mesh] OR bone demineral*[tiab] OR "Bone Remodeling"[Mesh] OR bone strength[tiab] OR bone formation[tiab] OR ((bone[tiab] OR bones[tiab] OR "Bone and Bones"[Mesh]) AND (fracture*[tiab] OR remodel*[tiab] OR formation*[tiab] OR osteolysis[tiab] OR ossification[tiab] OR resorption[tiab] OR accretion[tiab] OR BMC[tiab] OR BMD[tiab] OR "Biomarkers"[Mesh] OR biomarker*[tiab])))))) NOT (("Animals"[Mesh] NOT ("Animals"[Mesh] AND "Humans"[Mesh])))) NOT (editorial[ptyp] OR comment[ptyp] OR news[ptyp] OR letter[ptyp] OR review[ptyp] OR systematic review[ptyp] OR systematic review[ti] OR meta-analysis[ptyp] OR meta-analysis[ti] OR meta-analyses[ti] OR retracted publication[ptyp] OR retraction of publication[ptyp] OR retraction of publication[tiab] OR retraction notice[ti]) Sort by: PublicationDate Filters: Publication date from 2014/01/01; English

Database: Cochrane Central Register of Controlled Trials (CENTRAL)
Provider: John Wiley & Sons

Date(s) Searched: November 15, 2019
Date range searched: January 1, 2014 - November 15, 2019

#1 - (“dietary pattern*” OR “diet pattern*” OR “eating pattern*” OR “food pattern*” OR “diet quality*” OR “eating habit*” OR “dietary habit*” OR “diet habit*” OR “food habit*” OR “beverage habit*” OR [mh ^"Feeding Behavior"] OR “dietary profile*” OR “food profile*” OR “diet profile*” OR “eating profile*” OR “dietary guideline*” OR “dietary recommendation*” OR “dietary intake*” OR “eating style*” OR [mh "Diet, Mediterranean"] OR “Mediterranean Diet*” OR [mh "Dietary Approaches To Stop Hypertension"] OR “Dietary Approaches To Stop Hypertension Diet*” OR “DASH diet*” OR [mh "Diet, Gluten-Free"] OR “Gluten Free diet*” OR “prudent diet*” OR [mh "Diet, Paleolithic"] OR “Paleolithic Diet*” OR [mh "Diet, Vegetarian"] OR “vegetarian diet*” OR “vegan diet*” OR [mh "Healthy Diet"] OR “plant based diet*” OR [mh "Diet, Western"] OR “western diet*” OR [mh "Diet, Carbohydrate-Restricted"] OR “low-carbohydrate diet*” OR “high carbohydrate diet*” OR “Ketogenic Diet*” OR “Nordic Diet*” OR [mh "Diet, Fat-Restricted"] OR [mh "Diet, High-Fat"] OR [mh "Diet, High-Protein"] OR “high protein diet*” OR “protein intake*” OR “high-fat diet*” OR “low fat diet*” OR [mh "Diet, Protein-Restricted"] OR “low protein diet*” OR [mh "Diet, Sodium-Restricted"] OR “low-sodium diet*” OR “low salt diet*”):ti,ab,kw

#2 - (([mh "Dietary Proteins"] OR “dietary protein*” OR [mh "Dietary Carbohydrates"] OR “dietary carbohydrate*” OR [mh "Dietary Fats"] OR “dietary fat*” OR hypocaloric OR hypo-caloric) NEAR (diet OR diets OR consumption OR intake OR supplement*))

#3 - ("guideline adherence") NEAR (diet OR dietary OR food OR beverage OR nutrition*))

#4 - (“diet score” OR “diet scores” OR “diet quality score” OR “diet quality scores” OR “diet quality index” OR “dietary habits score” OR kidmed OR “diet index” OR “dietary index” OR “Food-based Index” OR “diet quality index” OR “food index” OR “food score” OR “food scores” OR “Mediterranean diet score” OR MedDietScore OR “healthy eating index” OR “food frequency questionnaire” OR “food frequency questionnaires” OR “food frequency survey” OR “food frequency surveys” OR [mh “Nutrition Surveys”] OR “nutrition survey” OR “nutrition surveys” OR “diet survey” OR “diet surveys” OR “food survey” OR “food surveys” OR “dietary questionnaire”):ti,ab,kw

#5 - (((pattern OR patterns OR consumption OR habit*) NEAR ([mh ^Diet] OR diet OR diets OR dietary OR [mh Food] OR food OR foods OR [mh Beverages] OR beverage OR beverages))):ti,ab,kw

#6 - #1 OR #2 OR #3 OR #4 OR #5

#7 - [mh "Bone Density"] OR [mh "Bone Development"] OR [mh "Fractures, Bone"] OR [mh "Bone Diseases"] OR [mh Osteoporosis] OR [mh Rickets] OR [mh "Bone Demineralization, Pathologic"] OR [mh "Bone Remodeling"]

#8 - ("bone density" OR "bone mineral density" OR "bone development" OR "bone fracture*" OR "bone disease*" OR "bone turnover" OR "bone loss" OR osteoporosis OR osteopen* OR osteitis OR Rickets OR "bone mineral*" OR "bone mass" OR "bone health*" OR "bone demineral*" OR "bone strength" OR "bone formation"):ti,ab,kw

#9 - (((bone OR bones OR [mh "Bone and Bones"]) NEAR/6 (fracture* OR remodel* OR formation* OR osteolysis OR ossification OR resorption OR accretion OR BMC OR BMD OR [mh Biomarkers] OR biomarker*))):ti,ab,kw

#10 - #7 OR #8 OR #9

#11 - #6 AND #10" with Publication Year from 2014 to present, in Trials (Word variations have been searched)

Database: Embase

Provider: Elsevier
Date(s) Searched: November 15, 2019
Date range searched: January 1, 2014 – November 15, 2019

#13) #7 AND #11 AND ([article]/lim OR [article in press]/lim) AND [humans]/lim AND [english]/lim AND [2000-2014]/py NOT ([conference abstract]/lim OR [conference paper]/lim OR [editorial]/lim OR [erratum]/lim OR [letter]/lim OR [note]/lim OR [review]/lim OR [systematic review]/lim OR [meta analysis]/lim)

#12) #7 AND #11

#11) #8 OR #9 OR #10

#10) ((bone OR bones) NEAR/6 (fracture* OR remodel* OR formation* OR osteolysis OR ossification OR resorption OR accretion OR bmc OR bmd OR biomarker*)):ab,ti

#9) 'bone density':ab,ti OR 'bone mineral density':ab,ti OR 'bone development':ab,ti OR 'bone fracture*':ab,ti OR 'bone disease*':ab,ti OR 'bone turnover':ab,ti OR 'bone loss':ab,ti OR osteoporosis:ab,ti OR osteopen*:ab,ti OR osteitis:ab,ti OR rickets:ab,ti OR 'bone mineral*':ab,ti OR 'bone mass':ab,ti OR 'bone health*':ab,ti OR 'bone demineral*':ab,ti OR 'bone strength':ab,ti OR 'bone formation':ab,ti

#8) 'bone disease'/exp OR 'bone density'/exp OR 'bone development'/exp OR 'fracture'/exp OR 'osteoporosis'/exp OR 'rickets'/exp OR 'bone demineralization'/exp OR 'bone remodeling'/exp

#7) #1 OR #2 OR #3 OR #4 OR #5 OR #6

#6) ((pattern OR patterns OR consumption OR habit*) NEAR/6 (diet OR diets OR dietary OR food OR foods OR beverage OR beverages)):ab,ti

#5) 'diet score':ab,ti OR 'diet quality score':ab,ti OR kidmed:ab,ti OR 'diet index':ab,ti OR 'dietary index':ab,ti OR 'diet quality index':ab,ti OR 'food score':ab,ti OR meddietscore:ab,ti OR 'healthy eating index':ab,ti

#4) ('guideline adherence' NEAR/6 (diet OR dietary OR food OR beverage OR nutrition*)):ab,ti

#3) (('dietary protein*' OR 'dietary carbohydrate*' OR 'dietary fat*' OR hypocaloric OR hypo-caloric) NEAR/6 (diet OR diets OR consumption OR intake OR supplement)):ab,ti

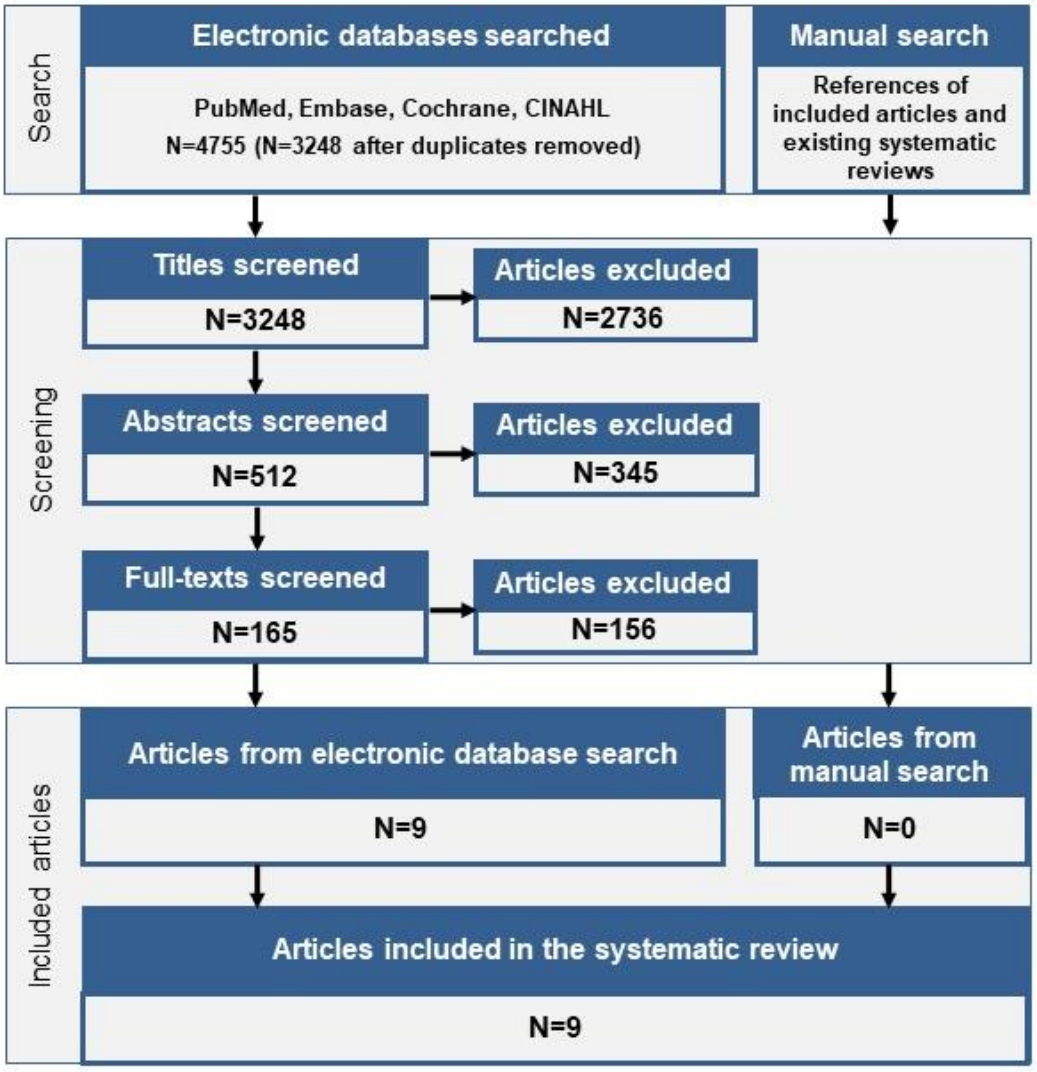
#2) 'dietary pattern*':ab,ti OR 'diet pattern*':ab,ti OR 'eating pattern*':ab,ti OR 'food pattern*':ab,ti OR 'diet quality*':ab,ti OR 'eating habit*':ab,ti OR 'dietary habit*':ab,ti OR 'diet habit*':ab,ti OR 'food habit*':ab,ti OR 'beverage habit*':ab,ti OR 'dietary profile*':ab,ti OR 'food profile*':ab,ti OR 'diet profile*':ab,ti OR 'eating profile*':ab,ti OR 'dietary guideline*':ab,ti OR 'dietary recommendation*':ab,ti OR 'dietary intake*':ab,ti OR 'eating style*':ab,ti OR 'mediterranean diet*':ab,ti OR 'dietary approaches to stop hypertension diet*':ab,ti OR 'dash diet*':ab,ti OR 'gluten free diet*':ab,ti OR 'prudent diet*':ab,ti OR 'paleolithic diet*':ab,ti OR 'vegetarian diet*':ab,ti OR 'vegan diet*':ab,ti OR 'plant based diet*':ab,ti OR 'western diet*':ab,ti OR 'low-carbohydrate diet*':ab,ti OR 'high carbohydrate diet*':ab,ti OR 'ketogenic diet*':ab,ti OR 'nordic diet*':ab,ti OR 'high protein diet*':ab,ti OR 'protein intake*':ab,ti OR 'high-fat diet*':ab,ti OR 'low fat diet*':ab,ti OR 'low protein diet*':ab,ti OR 'low-sodium diet*':ab,ti OR 'low salt diet*':ab,ti

#1) 'feeding behavior'/de OR 'mediterranean diet'/exp OR 'dash diet'/exp OR 'gluten free diet'/exp OR 'paleolithic diet'/de OR 'vegetarian diet'/exp OR 'healthy diet'/de OR 'western diet'/de OR 'low carbohydrate diet'/exp OR 'low fat diet'/de OR 'lipid diet'/exp OR 'protein diet'/exp OR 'protein restriction'/de OR 'sodium restriction'/de

LITERATURE SEARCH AND SCREENING RESULTS

The flow chart (**Figure 2**) below illustrates the literature search and screening results for articles examining the update to this systematic review question. The results of the electronic database searches, after removal of duplicates, were screened independently by two NESR analysts using a step-wise process by reviewing titles, abstracts, and full-texts to determine which articles met the inclusion criteria. A manual search was done to find articles that were not identified when searching the electronic databases; all manually identified articles are also screened to determine whether they meet criteria for inclusion.

Figure 2: Flow chart of literature search and screening results from the update to the existing review



Included articles

1. Benetou, V.,Orfanos, P.,Feskanich, D.,Michaelsson, K.,Pettersson-Kymmer, U.,Byberg, L.,Eriksson, S.,Grodstein, F.,Wolk, A.,Jankovic, N.,de Groot, Lcpgm,Boffetta, P.,Trichopoulou, A.. Mediterranean diet and hip fracture incidence among older adults: the CHANCES project. *Osteoporos Int.* 2018. 29:1591-1599 https://www.ncbi.nlm.nih.gov/pubmed/29656347
2. Byberg, L.,Bellavia, A.,Larsson, S. C.,Orsini, N.,Wolk, A.,Michaelsson, K.. Mediterranean Diet and Hip Fracture in Swedish Men and Women. *J Bone Miner Res.* 2016. 31:2098-2105 https://www.ncbi.nlm.nih.gov/pubmed/27345330
3. de Jonge, E. A.,Kiefte-de Jong, J. C.,Hofman, A.,Uitterlinden, A. G.,Kieboom, B. C.,Voortman, T.,Franco, O. H.,Rivadeneira, F.. Dietary patterns explaining differences in bone mineral density and hip structure in the elderly: the Rotterdam Study. *Am J Clin Nutr.* 2017. 105:203-211 https://www.ncbi.nlm.nih.gov/pubmed/27903522
4. Fung, T. T.,Feskanich, D.. Dietary patterns and risk of hip fractures in postmenopausal women and men over 50 years. *Osteoporos Int.* 2015. 26:1825-30 https://www.ncbi.nlm.nih.gov/pubmed/25731807
5. Fung, T. T.,Meyer, H. E.,Willett, W. C.,Feskanich, D.. Association between Diet Quality Scores and Risk of Hip Fracture in Postmenopausal Women and Men Aged 50 Years and Older. *J Acad Nutr Diet.* 2018. 118:2269-2279.e4 https://www.ncbi.nlm.nih.gov/pubmed/29398568
6. Haring, B.,Crandall, C. J.,Wu, C.,LeBlanc, E. S.,Shikany, J. M.,Carbone, L.,Orchard, T.,Thomas, F.,Wactawaski-Wende, J.,Li, W.,Cauley, J. A.,Wassertheil-Smoller, S.. Dietary Patterns and Fractures in Postmenopausal Women: Results From the Women's Health Initiative. *JAMA Intern Med.* 2016. 176:645-52 https://www.ncbi.nlm.nih.gov/pubmed/27019044
7. Monjardino, T.,Lucas, R.,Ramos, E.,Barros, H.. Associations between a priori-defined dietary patterns and longitudinal changes in bone mineral density in adolescents. *Public Health Nutr.* 2014. 17:195-205 https://www.ncbi.nlm.nih.gov/pubmed/23149164
8. Monjardino, T.,Lucas, R.,Ramos, E.,Lopes, C.,Gaio, R.,Barros, H.. Associations between a posteriori defined dietary patterns and bone mineral density in adolescents. *Eur J Nutr.* 2015. 54:273-82 https://www.ncbi.nlm.nih.gov/pubmed/24806081
9. Warensjo Lemming, E.,Byberg, L.,Melhus, H.,Wolk, A.,Michaelsson, K.. Long-term a posteriori dietary patterns and risk of hip fractures in a cohort of women. *Eur J Epidemiol.* 2017. 32:605-616 https://www.ncbi.nlm.nih.gov/pubmed/28585122

Excluded Articles

The table below lists the articles excluded after full-text screening, and includes a column for the categories of inclusion and exclusion criteria (see Table 1) that studies were excluded based on. At least one reason for exclusion is provided for each article, though this may not reflect all possible reasons for exclusion. Information about articles excluded after title and abstract screening is available upon request.

Table 2. Articles excluded after full text screening with rationale for exclusion

	Citation	Rationale
1	Draaisma, JMT, Hampsink, BM, Janssen, M, van Houdt, NBM, Linders, Etam, Willemsen, MA. The Ketogenic Diet and Its Effect on Bone Mineral Density: A Retrospective Observational Cohort Study. Neuropediatrics. 2019. doi:10.1055/s-0039-1693059	Intervention/Exposure; Health Status
2	Svedlund, A, Hallbook, T, Magnusson, P, Dahlgren, J, Swolin-Eide, D. Prospective study of growth and bone mass in Swedish children treated with the modified Atkins diet. Eur J Paediatr Neurol. 2019. 23:629-638. doi:10.1016/j.ejpn.2019.04.001	Country; Health Status
3	Ambroszkiewicz, J, Chelchowska, M, Szamotulska, K, Rowicka, G, Klemarczyk, W, Strucinska, M, Gajewska, J. Bone status and adipokine levels in children on vegetarian and omnivorous diets. Clin Nutr. 2019. 38:730-737. doi:10.1016/j.clnu.2018.03.010	Study Design
4	Perez-Rey, J, Roncero-Martin, R, Rico-Martin, S, Rey-Sanchez, P, Pedrera-Zamorano, JD, Pedrera-Canal, M, Lopez-Espuela, F, Lavado Garcia, JM. Adherence to a Mediterranean Diet and Bone Mineral Density in Spanish Premenopausal Women. Nutrients. 2019. 11. doi:10.3390/nu11030555	Study Design
5	Steell, L, Sillars, A, Welsh, P, Iliodromiti, S, Wong, SC, Pell, JP, Sattar, N, Gill, JMR, Celis-Morales, CA, Gray, SR. Associations of dietary protein intake with bone mineral density: An observational study in 70,215 UK Biobank participants. Bone. 2019. 120:38-43. doi:10.1016/j.bone.2018.10.003	Study Design; Intervention/Exposure
6	Weaver, AA, Houston, DK, Shapses, SA, Lyles, MF, Henderson, RM, Beavers, DP, Baker, AC, Beavers, KM. Effect of a hypocaloric, nutritionally complete, higher-protein meal plan on bone density and quality in older adults with obesity: a randomized trial. Am J Clin Nutr. 2019. 109:478-486. doi:10.1093/ajcn/nqy237	Intervention/Exposure; Comparator
7	Kim, HS, Sohn, C, Kwon, M, Na, W, Shivappa, N, Hebert, JR, Kim, MK. Positive Association between Dietary Inflammatory Index and the Risk of Osteoporosis: Results from the KoGES_Health Examinee (HEXA) Cohort Study. Nutrients. 2018. 10. doi:10.3390/nu10121999	Intervention/Exposure

	Citation	Rationale
8	Shaw, SC, Parsons, CM, Fuggle, NR, Edwards, MH, Robinson, SM, Dennison, EM, Cooper, C, Ward, KA. Diet Quality and Bone Measurements Using HRpQCT and pQCT in Older Community-Dwelling Adults from the Hertfordshire Cohort Study. Calcif Tissue Int. 2018. 103:494-500. doi:10.1007/s00223-018-0445-x	Outcome
9	Bielemann, RM, Dos, SVazJ, Domingues, MR, Matijasevich, A, Santos, IS, Ekelund, U, Horta, BL. Are consumption of dairy products and physical activity independently related to bone mineral density of 6-year-old children? Longitudinal and cross-sectional analyses in a birth cohort from Brazil. Public Health Nutr. 2018. 21:2654-2664. doi:10.1017/s1368980018001258	Intervention/Exposure
10	Correa-Rodriguez, M, Schmidt-Rio Valle, J, de la Fuente-Vilchez, AM, Rueda-Medina, B. Analysis of lifestyle and bone mineralization in a population of Spanish young adults. Colomb Med (Cali). 2018. 49:213-218. doi:10.25100/cm.v49i2.2056	Study Design
11	Cao, JJ, Whigham, LD, Jahns, L. Depletion and repletion of fruit and vegetable intake alters serum bone turnover markers: a 28-week single-arm experimental feeding intervention. Br J Nutr. 2018. 120:500-507. doi:10.1017/s0007114518001642	Study Design; Outcome
12	Melaku, YA, Gill, TK, Taylor, AW, Adams, R, Shi, Z. A comparison of principal component analysis, partial least-squares and reduced-rank regressions in the identification of dietary patterns associated with bone mass in ageing Australians. Eur J Nutr. 2018. 57:1969-1983 . doi:10.1007/s00394-017-1478-z	Outcome
13	Hansen, TH, Madsen, MTB, Jorgensen, NR, Cohen, AS, Hansen, T, Vestergaard, H, Pedersen, O, Allin, KH. Bone turnover, calcium homeostasis, and vitamin D status in Danish vegans. Eur J Clin Nutr. 2018. 72:1046-1054. doi:10.1038/s41430-017-0081-y	Study Design; Intervention/Exposure
14	Moradi, S, Khorrami-Nezhad, L, Ali-Akbar, S, Zare, F, Alipour, T, Dehghani Kari Bozorg, A, Yekaninejad, MS, Maghbooli, Z, Mirzaei, K. The associations between dietary patterns and bone health, according to the TGF-beta1 T869-->C polymorphism, in postmenopausal Iranian women. Aging Clin Exp Res. 2018. 30:563-571. doi:10.1007/s40520-017-0828-2	Study Design
15	Rogers, TS, Harrison, S, Judd, S, Orwoll, ES, Marshall, LM, Shannon, J, Langsetmo, L, Lane, NE, Shikany, JM. Dietary patterns and longitudinal change in hip bone mineral density among older men. Osteoporos Int. 2018. 29:1135-1145. doi:10.1007/s00198-018-4388-x	Outcome
16	Hassoon, A, Michos, ED, Miller, ER, Crisp, Z, Appel, LJ. Effects of Different Dietary Interventions on Calcitriol, Parathyroid Hormone, Calcium, and Phosphorus: Results from the DASH Trial. Nutrients. 2018. 10. doi:10.3390/nu10030367	Sample Size; Study Duration

	Citation	Rationale
17	Movassagh, EZ, Baxter-Jones, ADG, Kontulainen, S, Whiting, S, Szafron, M, Vatanparast, H. Vegetarian-style dietary pattern during adolescence has long-term positive impact on bone from adolescence to young adulthood: a longitudinal study. Nutr J. 2018. 17:36. doi:10.1186/s12937-018-0324-3	Study Design; Outcome
18	Ambroszkiewicz, J, Chelchowska, M, Szamotulska, K, Rowicka, G, Klemarczyk, W, Strucinska, M, Gajewska, J. The Assessment of Bone Regulatory Pathways, Bone Turnover, and Bone Mineral Density in Vegetarian and Omnivorous Children. Nutrients. 2018. 10. doi:10.3390/nu10020183	Study Design
19	de Jonge, EAL, Rivadeneira, F, Erler, NS, Hofman, A, Uitterlinden, AG, Franco, OH, Kiefte-de Jong, JC. Dietary patterns in an elderly population and their relation with bone mineral density: the Rotterdam Study. Eur J Nutr. 2018. 57:61-73. doi:10.1007/s00394-016-1297-7	Outcome
20	Antonio, J, Ellerbroek, A, Evans, C, Silver, T, Peacock, CA. High protein consumption in trained women: bad to the bone? J Int Soc Sports Nutr. 2018. 15:6. doi:10.1186/s12970-018-0210-6	Intervention/Exposure
21	Veronese, N, Stubbs, B, Koyanagi, A, Hebert, JR, Cooper, C, Caruso, MG, Guglielmi, G, Reginster, JY, Rizzoli, R, Maggi, S, Shivappa, N. Pro-inflammatory dietary pattern is associated with fractures in women: an eight-year longitudinal cohort study. Osteoporos Int. 2018. 29:143-151. doi:10.1007/s00198-017-4251-5	Intervention/Exposure
22	Yang, TC, Aucott, LS, Duthie, GG, Macdonald, HM. An application of partial least squares for identifying dietary patterns in bone health. Arch Osteoporos. 2017. 12:63. doi:10.1007/s11657-017-0355-y	Study Design
23	Melaku, YA, Gill, TK, Taylor, AW, Adams, R, Shi, Z. Association between nutrient patterns and bone mineral density among ageing adults. Clin Nutr ESPEN. 2017. 22:97-106. doi:10.1016/j.clnesp.2017.08.001	Intervention/Exposure; Outcome
24	Melaku, YA, Gill, TK, Appleton, SL, Taylor, AW, Adams, R, Shi, Z. Prospective Associations of Dietary and Nutrient Patterns with Fracture Risk: A 20-Year Follow-Up Study. Nutrients. 2017. 9. doi:10.3390/nu9111198	Country
25	Simm, PJ, Bicknell-Royle, J, Lawrie, J, Nation, J, Draffin, K, Stewart, KG, Cameron, FJ, Scheffer, IE, Mackay, MT. The effect of the ketogenic diet on the developing skeleton. Epilepsy Res. 2017. 136:62-66. doi:10.1016/j.eplepsyres.2017.07.014	Health Status
26	Erkkila, AT, Sadeghi, H, Isanejad, M, Mursu, J, Tuppurainen, M, Kroger, H. Associations of Baltic Sea and Mediterranean dietary patterns with bone mineral density in elderly women. Public Health Nutr. 2017. 20:2735-2743. doi:10.1017/s1368980017001793	Sample Size

	Citation	Rationale
27	Li, SKY, Wan, MMP, Siu, FPL, Chung, S, Pang, MYC. Relationship Between Nutritional Factors and Hip Bone Density in Individuals with Chronic Stroke. Calcif Tissue Int. 2017. 101:259-270. doi:10.1007/s00223-017-0276-1	Intervention/Exposure
28	Shin, S, Kim, SH, Joung, H, Park, MJ. Milk-cereal and whole-grain dietary patterns protect against low bone mineral density among male adolescents and young adults. Eur J Clin Nutr. 2017. 71:1101-1107. doi:10.1038/ejcn.2017.81	Study Design
29	Correa Rodriguez, M, Schmidt-RioValle, J, Rueda-Medina, B. Dietary antioxidant quality score (DAQs) is associated with bone mass assessed by calcaneal quantitative ultrasound in young women. Nutr Hosp. 2017. 34:613-618. doi:10.20960/nh.468	Study Design
30	Heer, M, Baecker, N, Frings-Meuthen, P, Graf, S, Zwart, SR, Biolo, G, Smith, SM. Effects of high-protein intake on bone turnover in long-term bed rest in women. Appl Physiol Nutr Metab. 2017. 42:537-546. doi:10.1139/apnm-2016-0292	Intervention/Exposure
31	Colica, C, Merra, G, Gasbarrini, A, De Lorenzo, A, Cioccoloni, G, Gualtieri, P, Perrone, MA, Bernardini, S, Bernardo, V, Di Renzo, L, Marchetti, M. Efficacy and safety of very-low-calorie ketogenic diet: a double blind randomized crossover study. Eur Rev Med Pharmacol Sci. 2017. 21:2274-2289.	Intervention/Exposure
32	Orchard, T, Yildiz, V, Steck, SE, Hebert, JR, Ma, Y, Cauley, JA, Li, W, Mossavar-Rahmani, Y, Johnson, KC, Sattari, M, LeBoff, M, Wactawski-Wende, J, Jackson, RD. Dietary Inflammatory Index, Bone Mineral Density, and Risk of Fracture in Postmenopausal Women: Results From the Women's Health Initiative. J Bone Miner Res. 2017. 32:1136-1146. doi:10.1002/jbmr.3070	Intervention/Exposure
33	Aparicio, VA, Ruiz-Cabello, P, Borges-Cosic, M, Andrade, A, Coll-Risco, I, Acosta-Manzano, P, Soriano-Maldonado, A. Association of physical fitness, body composition, cardiometabolic markers and adherence to the Mediterranean diet with bone mineral density in perimenopausal women. The FLAMENCO project. J Sports Sci. 2017. 35:880-887. doi:10.1080/02640414.2016.1196825	Study Design
34	Savanelli, MC, Barrea, L, Macchia, PE, Savastano, S, Falco, A, Renzullo, A, Scarano, E, Nettore, IC, Colao, A, Di Somma, C. Preliminary results demonstrating the impact of Mediterranean diet on bone health. J Transl Med. 2017. 15:81. doi:10.1186/s12967-017-1184-x	Study Design
35	Fung, TT, Meyer, HE, Willett, WC, Feskanich, D. Protein intake and risk of hip fractures in postmenopausal women and men age 50 and older. Osteoporos Int. 2017. 28:1401-1411. doi:10.1007/s00198-016-3898-7	Intervention/Exposure

	Citation	Rationale
36	Mangano, KM, Sahni, S, Kiel, DP, Tucker, KL, Dufour, AB, Hannan, MT. Dietary protein is associated with musculoskeletal health independently of dietary pattern: the Framingham Third Generation Study. Am J Clin Nutr. 2017. 105:714-722. doi:10.3945/ajcn.116.136762	Outcome
37	Langsetmo, L, Shikany, JM, Cawthon, PM, Cauley, JA, Taylor, BC, Vo, TN, Bauer, DC, Orwoll, ES, Schousboe, JT, Ensrud, KE. The Association Between Protein Intake by Source and Osteoporotic Fracture in Older Men: A Prospective Cohort Study. J Bone Miner Res. 2017. 32:592-600. doi:10.1002/jbmr.3058	Intervention/Exposure
38	Forero-Bogota, MA, Ojeda-Pardo, ML, Garcia-Hermoso, A, Correa-Bautista, JE, Gonzalez-Jimenez, E, Schmidt-RioValle, J, Navarro-Perez, CF, Gracia-Marco, L, Vlachopoulos, D, Martinez-Torres, J, Ramirez-Velez, R. Body Composition, Nutritional Profile and Muscular Fitness Affect Bone Health in a Sample of Schoolchildren from Colombia: The Fuprecol Study. Nutrients. 2017. 9. doi:10.3390/nu9020106	Study Design
39	Chevalley, T, Bonjour, JP, Audet, MC, Merminod, F, van Rietbergen, B, Rizzoli, R, Ferrari, S. Prepubertal Impact of Protein Intake and Physical Activity on Weight-Bearing Peak Bone Mass and Strength in Males. J Clin Endocrinol Metab. 2017. 102:157-166. doi:10.1210/jc.2016-2449	Intervention/Exposure
40	Melaku, YA, Gill, TK, Adams, R, Shi, Z. Association between dietary patterns and low bone mineral density among adults aged 50 years and above: findings from the North West Adelaide Health Study (NWAHS). Br J Nutr. 2016. 116:1437-1446. doi:10.1017/s0007114516003366	Study Design
41	Cauley, JA, Cawthon, PM, Peters, KE, Cummings, SR, Ensrud, KE, Bauer, DC, Taylor, BC, Shikany, JM, Hoffman, AR, Lane, NE, Kado, DM, Stefanick, ML, Orwoll, ES. Risk Factors for Hip Fracture in Older Men: The Osteoporotic Fractures in Men Study (MrOS). J Bone Miner Res. 2016. 31:1810-1819. doi:10.1002/jbmr.2836	Intervention/Exposure
42	Brinkworth, GD, Wycherley, TP, Noakes, M, Buckley, JD, Clifton, PM. Long-term effects of a very-low-carbohydrate weight-loss diet and an isocaloric low-fat diet on bone health in obese adults. Nutrition. 2016. 32:1033-6. doi:10.1016/j.nut.2016.03.003	Intervention/Exposure
43	Ward, KA, Prentice, A, Kuh, DL, Adams, JE, Ambrosini, GL. Life Course Dietary Patterns and Bone Health in Later Life in a British Birth Cohort Study. J Bone Miner Res. 2016. 31:1167-76. doi:10.1002/jbmr.2798	Outcome

	Citation	Rationale
44	Langsetmo, L, Barr, SI, Dasgupta, K, Berger, C, Kovacs, CS, Josse, RG, Adachi, JD, Hanley, DA, Prior, JC, Brown, JP, Morin, SN, Davison, KS, Goltzman, D, Kreiger, N. Dietary patterns in men and women are simultaneously determinants of altered glucose metabolism and bone metabolism. Nutr Res. 2016. 36:328-336. doi:10.1016/j.nutres.2015.12.010	Outcome
45	Vuolo, L, Barrea, L, Savanelli, MC, Savastano, S, Rubino, M, Scarano, E, Soprano, M, Illario, M, Colao, A, Di Somma, C. Nutrition and Osteoporosis: Preliminary data of Campania Region of European PERsonalised ICT Supported Service for Independent Living and Active Ageing. Transl Med UniSa. 2015. 13:13-8.	Study Design
46	van den Hooven, EH, Ambrosini, GL, Huang, RC, Mountain, J, Straker, L, Walsh, JP, Zhu, K, Oddy, WH. Identification of a dietary pattern prospectively associated with bone mass in Australian young adults. Am J Clin Nutr. 2015. 102:1035-43. doi:10.3945/ajcn.115.110502	Outcome
47	Langsetmo, L, Barr, SI, Berger, C, Kreiger, N, Rahme, E, Adachi, JD, Papaioannou, A, Kaiser, SM, Prior, JC, Hanley, DA, Kovacs, CS, Josse, RG, Goltzman, D. Associations of Protein Intake and Protein Source with Bone Mineral Density and Fracture Risk: A Population-Based Cohort Study. J Nutr Health Aging. 2015. 19:861-8. doi:10.1007/s12603-015-0544-6	Intervention/Exposure
48	Chen, Y, Xiang, J, Wang, Z, Xiao, Y, Zhang, D, Chen, X, Li, H, Liu, M, Zhang, Q. Associations of Bone Mineral Density with Lean Mass, Fat Mass, and Dietary Patterns in Postmenopausal Chinese Women: A 2-Year Prospective Study. PLoS One. 2015. 10:e0137097. doi:10.1371/journal.pone.0137097	Outcome
49	de Jonge, EA, Kiefte-de Jong, JC, de Groot, LC, Voortman, T, Schoufour, JD, Zillikens, MC, Hofman, A, Uitterlinden, AG, Franco, OH, Rivadeneira, F. Development of a Food Group-Based Diet Score and Its Association with Bone Mineral Density in the Elderly: The Rotterdam Study. Nutrients. 2015. 7:6974-90. doi:10.3390/nu7085317	Outcome
50	van den Hooven, EH, Heppe, DH, Kiefte-de Jong, JC, Medina-Gomez, C, Moll, HA, Hofman, A, Jaddoe, VW, Rivadeneira, F, Franco, OH. Infant dietary patterns and bone mass in childhood: the Generation R Study. Osteoporos Int. 2015. 26:1595-604. doi:10.1007/s00198-015-3033-1	Age at Intervention or Exposure
51	Petersen, SB, Rasmussen, MA, Olsen, SF, Vestergaard, P, Molgaard, C, Halldorsson, TI, Strom, M. Maternal dietary patterns during pregnancy in relation to offspring forearm fractures: prospective study from the Danish National Birth Cohort. Nutrients. 2015. 7:2382-400. doi:10.3390/nu7042382	Intervention/Exposure; Age at Intervention or Exposure
52	Shin, S, Sung, J, Joung, H. A fruit, milk and whole grain dietary pattern is positively associated with bone mineral density in Korean healthy adults. Eur J Clin Nutr. 2015. 69:442-8. doi:10.1038/ejcn.2014.231	Study Design

	Citation	Rationale
53	Munshi, R, Kochhar, A, Garg, V. Impact of Dietary Habits and Physical Activity on Bone Health among 40 to 60 Year Old Females at Risk of Osteoporosis in India. Ecol Food Nutr. 2015. 54:470-92. doi:10.1080/03670244.2015.1015120	Intervention/Exposure
54	Kim, MH, Lee, JS, Johnson, MA. Poor Socioeconomic and Nutritional Status Are Associated with Osteoporosis in Korean Postmenopausal Women: Data from the Fourth Korea National Health and Nutrition Examination Survey (KNHANES) 2009. J Am Coll Nutr. 2015. 34:400-7. doi:10.1080/07315724.2014.945197	Study Design
55	Go, G, Tserendejid, Z, Lim, Y, Jung, S, Min, Y, Park, H. The association of dietary quality and food group intake patterns with bone health status among Korean postmenopausal women: a study using the 2010 Korean National Health and Nutrition Examination Survey Data. Nutr Res Pract. 2014. 8:662-9. doi:10.4162/nrp.2014.8.6.662	Study Design
56	Hu, T, Rianon, NJ, Nettleton, JA, Hyder, JA, He, J, Steffen, LM, Jacobs, DR, Jr, Criqui, MH, Bazzano, LA. Protein intake and lumbar bone density: the Multi-Ethnic Study of Atherosclerosis (MESA). Br J Nutr. 2014. 112:1384-92. doi:10.1017/s0007114514002220	Intervention/Exposure
57	Chevalley, T, Bonjour, JP, van Rietbergen, B, Ferrari, S, Rizzoli, R. Tracking of environmental determinants of bone structure and strength development in healthy boys: an eight-year follow up study on the positive interaction between physical activity and protein intake from prepuberty to mid-late adolescence. J Bone Miner Res. 2014. 29:2182-92. doi:10.1002/jbmr.2247	Intervention/Exposure
58	Lousuebsakul-Matthews, V, Thorpe, DL, Knutsen, R, Beeson, WL, Fraser, GE, Knutsen, SF. Legumes and meat analogues consumption are associated with hip fracture risk independently of meat intake among Caucasian men and women: the Adventist Health Study-2. Public Health Nutr. 2014. 17:2333-43. doi:10.1017/s1368980013002693	Intervention/Exposure
59	Dalskov, SM, Muller, M, Ritz, C, Damsgaard, CT, Papadaki, A, Saris, WH, Astrup, A, Michaelsen, KF, Molgaard, C. Effects of dietary protein and glycaemic index on biomarkers of bone turnover in children. Br J Nutr. 2014. 111:1253-62. doi:10.1017/s0007114513003760	Intervention/Exposure
60	Dai, Z, Butler, LM, van Dam, RM, Ang, LW, Yuan, JM, Koh, WP. Adherence to a vegetable-fruit-soy dietary pattern or the Alternative Healthy Eating Index is associated with lower hip fracture risk among Singapore Chinese. J Nutr. 2014. 144:511-8. doi:10.3945/jn.113.187955	Country

	Citation	Rationale
61	Cao, JJ, Pasiakos, SM, Margolis, LM, Sauter, ER, Whigham, LD, McClung, JP, Young, AJ, Combs, GF, Jr. Calcium homeostasis and bone metabolic responses to high-protein diets during energy deficit in healthy young adults: a randomized controlled trial. Am J Clin Nutr. 2014. 99:400-7. doi:10.3945/ajcn.113.073809	Intervention/Exposure
62	Romera Baures, M, Morales Ivorra, I. Mediterranean diet and osteoarthritis. Reumatologia Clinica. 2019. 15:125-126. doi:10.1016/j.reuma.2018.12.001	Outcome
63	Jennings, A, Cashman, KD, Gillings, R, Cassidy, A, Tang, J, Fraser, W, Dowling, KG, Hull, GLJ, Berendsen, AAM, De Groot, LCPGM, Pietruszka, B, Wierzbicka, E, Ostan, R, Bazzocchi, A, Battista, G, Caumon, E, Meunier, N, Malpuech-Brugère, C, Franceschi, C, Santoro, A, Fairweather-Tait, SJ. A Mediterranean-like dietary pattern with Vitamin D3 (10 µg/d) supplements reduced the rate of bone loss in older Europeans with osteoporosis at baseline: Results of a 1-y randomized controlled trial. American Journal of Clinical Nutrition. 2018. 108:633-640. doi:10.1093/ajcn/nqy122	Health Status
64	Moradi, S, Khorrami-nezhad, L, Ali-akbar, S, Zare, F, Alipour, T, Dehghani Kari Bozorg, A, Yekaninejad, MS, Maghbooli, Z, Mirzaei, K. The associations between dietary patterns and bone health, according to the TGF-β1 T869→C polymorphism, in postmenopausal Iranian women. Aging Clinical and Experimental Research. 2018. 30:563-571. doi:10.1007/s40520-017-0828-2	Study Design
65	Cao, JJ, Pasiakos, SM, Margolis, LM, Sauter, ER, Whigham, LD, McClung, JP, Young, AJ, Combs Jr, GF. Calcium homeostasis and bone metabolic responses to high-protein diets during energy deficit in healthy young adults: A randomized controlled trial1-4. American Journal of Clinical Nutrition. 2014. 99:400-407. doi:10.3945/ajcn.113.073809	Intervention/Exposure
66	Subramonian, SS, Parker, AJP, Champion, HC. Bone health in Ketogenic diet therapy. Developmental medicine and child neurology. 2019. 61:88-. doi:10.1111/dmcn.14120	Intervention/Exposure; Health Status
67	Gao, R, Duff, W, Chizen, D, Zello, GA, Chilibeck, PD. The effect of a low glycemic index pulse-based diet on insulin sensitivity, insulin resistance, bone resorption and cardiovascular risk factors during bed rest. Nutrients. 2019. 11. doi:10.3390/nu11092012	Sample Size; Study Duration
68	Jennings, A, Cashman, KD, Gillings, R, Cassidy, A, Tang, J, Fraser, W, Dowling, KG, Hull, GLJ, Berendsen, AAM, de Groot, Lcpgm, etal,. A Mediterranean-like dietary pattern with vitamin D3 (10 µg/d) supplements reduced the rate of bone loss in older Europeans with osteoporosis at baseline: results of a 1-y randomized controlled trial. American journal of clinical nutrition. 2018. 108:633-640. doi:10.1093/ajcn/nqy122	Health Status

	Citation	Rationale
69	Nakayama, A, Lutz, L, Hruby, A, Karl, JP, McClung, J, Gaffney-Stomberg, E. A dietary pattern rich in calcium, potassium, and protein is associated with tibia bone mineral content and strength in young adults entering initial military training. Journal of bone and mineral research. 2017. 32:S369. doi:10.1002/jbmr.3363	Study Design
70	Wright, C, Zhou, J, Campbell, W. Increased milk protein isolate consumption during diet-induced energy restriction does not influence changes in bone quantity in overweight and obese older adults. Journal of bone and mineral research. 2017. 31. doi:10.1002/jbmr.3107	Intervention/Exposure
71	Yildiz, V, Steck, S, Hebert, J, Jackson, R. Association of the Dietary Inflammatory Index, bone mineral density and risk of fracture in postmenopausal women. Journal of bone and mineral research. Conference: 2015 annual meeting of the american society for bone and mineral research, ASBMR 2015. United states. 2015. 30. doi:10.1002/jbmr.2763	Intervention/Exposure
72	Hu, T, Yao, L, Bazzano, L. Effects of a 12-month low-carbohydrate diet vs. A low-fat diet on bone mineral density: a randomized controlled trial. FASEB journal. 2016. 30.	Intervention/Exposure
73	Hassoon, A, Appel, L, Miller, E. Effects of dietary patterns on vitamin D and other markers of bone-mineral metabolism: results from the DASH trial. Circulation. 2015. 131.	Publication Status
74	Lee, H, Choi-Kwon, S, Choi, SH. The Effects of Korean DASH Diet Education with Calcium/Vitamin D Supplements on Nutrient Intakes, Food Consumption, Bone Turnover Markers and Bone Mineral Density among Korean Elderly Women. Korean j adult nurs. 2015. 27:94-105. doi:10.7475/kjan.2015.27.1.94	Intervention/Exposure
75	Pedone, C, Napoli, N, Pozzilli, P, Lauretani, F, Bandinelli, S, Ferrucci, L, Antonelli-Incalzi, R. Quality of diet and potential renal acid load as risk factors for reduced bone density in elderly women. Bone. 2010. 46:1063-1067. doi:10.1016/j.bone.2009.11.031	Intervention/Exposure
76	Patel, A, Pyzik, PL, Turner, Z, Rubenstein, JE, Kossoff, EH. Long-term outcomes of children treated with the ketogenic diet in the past. Epilepsia. 2010. 51:1277-1282. doi:10.1111/j.1528-1167.2009.02488.x	Health Status
77	Park, SJ, Joo, SE, Min, H, Park, JK, Kim, Y, Kim, SS, Ahn, Y. Dietary Patterns and Osteoporosis Risk in Postmenopausal Korean Women. Osong Public Health and Research Perspectives. 2012. 3:199-205. doi:10.1016/j.phrp.2012.10.005	Publication Date

	Citation	Rationale
78	Nct,. Effectiveness of a Low Carbohydrate Diet Versus a High Carbohydrate Diet in Promoting Weight Loss and Improved Health. https://clinicaltrials.gov/show/NCT00200720. 2005.	Study Design; Publication Status
79	Actrn,. 2008 Weight Loss, Protein and Bone Density study. http://www.who.int/trialsearch/Trial2.aspx?TrialID=ACTRN12608000229370. 2008.	Intervention/Exposure; Publication Status
80	Casazza, K. A reduced carbohydrate diet results in loss in lean mass in peripubertal African American girls. FASEB journal. 2010. 24.	Intervention/Exposure; Outcome
81	Nct,. Effect of Diet Composition on Weight Change and Metabolic Parameters. https://clinicaltrials.gov/show/NCT01642849. 2012.	Study Design; Intervention/Exposure
82	Clifton, PM, Noakes, M, Keogh, J, Foster, P. Effect of an energy reduced high protein red meat diet on weight loss and metabolic parameters in obese women. Asia pacific journal of clinical nutrition. 2003. 12 Suppl: S10.	Intervention/Exposure; Publication Date
83	McCarter, DF. Low-carbohydrate diet effective for adults. Journal of family practice. 2003. 52:515-516.	Study Design; Intervention/Exposure; Publication Status
84	Foster, GD, Wyatt, HR, Hill, JO, Makris, AP, Rosenbaum, DL, Brill, C, Stein, RI, Mohammed, S, Miller, B, Rader, DJ, etal,. Weight and metabolic outcomes after 2 years on a low-carbohydrate versus low-fat diet. Obstetrical & gynecological survey. 2010. 65:769-770. doi:10.1097/OGX.0b013e31821342ba	Intervention/Exposure; Publication Status
85	Thorpe, MP, Mojtahedi, MC, Richey, AL, Layman, DK, Evans, EM. Higher protein weight loss diet does not affect bone mineral density (BMD) in a double-blind RCT in postmenopausal women. FASEB journal. 2010. 24.	Intervention/Exposure; Publication Status
86	Tirosh, A, Carey, V, Sacks, F, Bray, G, Smith, SR, Leboff, M. The effect of weight loss and dietary macronutrient composition on bone mineral density-results of a randomized controlled trial. Journal of bone and mineral research. 2011. 26.	Intervention/Exposure; Publication Status
87	Nct, Meat Protein and Calcium: do They Interact Synergistically or Antagonistically? https://clinicaltrials.gov/show/NCT00700804. 2008.	Publication Date; Publication Status

	Citation	Rationale
88	Bowen, J, Noakes, M, Clifton, P. High dairy-protein versus high mixed-protein energy restricted diets - the effect on bone turnover and calcium excretion in overweight adults. Asia pacific journal of clinical nutrition. 2003. 12 Suppl: S52.	Publication Date
89	Brinkworth, G, Noakes, M, Buckley, J, Clifton, P. Long-term effects of a moderate energy restricted, very low carbohydrate diet on bone health in abdominally obese individuals. FASEB journal. 2011. 25.	Intervention/Exposure
90	Fitzmaurice, D, Doyle, L. The effect of a low-carbohydrate diet on biomarkers of bone health in pre-and post-menopausal females: a randomized control crossover trial. Proceedings of the nutrition society. 2011. 70:E355. doi:10.1017/S002966511100440X	Intervention/Exposure; Publication Status
91	Brown, RC, Cox, CM, Goulding, A. High-carbohydrate versus high-fat diets: effect on body composition in trained cyclists. Med Sci Sports Exerc. 2000. 32:690-4. doi:10.1097/00005768-200003000-00021	Intervention/Exposure
92	Kerstetter, JE, Looker, AC, Insogna, KL. Low dietary protein and low bone density. Calcif Tissue Int. 2000. 66:313. doi:10.1007/s002230010062	Intervention/Exposure; Publication Status
93	Frassetto, LA, Todd, KM, Morris, RC, Jr, Sebastian, A. Worldwide incidence of hip fracture in elderly women: relation to consumption of animal and vegetable foods. J Gerontol A Biol Sci Med Sci. 2000. 55:M585-92. doi:10.1093/gerona/55.10.m585	Intervention/Exposure; Publication Date
94	Hannan, MT, Tucker, KL, Dawson-Hughes, B, Cupples, LA, Felson, DT, Kiel, DP. Effect of dietary protein on bone loss in elderly men and women: the Framingham Osteoporosis Study. J Bone Miner Res. 2000. 15:2504-12. doi:10.1359/jbmr.2000.15.12.2504	Intervention/Exposure
95	Merrilees, MJ, Smart, EJ, Gilchrist, NL, Frampton, C, Turner, JG, Hooke, E, March, RL, Maguire, P. Effects of diary food supplements on bone mineral density in teenage girls. Eur J Nutr. 2000. 39:256-62. doi:10.1007/s003940070004	Intervention/Exposure; Publication Date
96	Sellmeyer, DE, Stone, KL, Sebastian, A, Cummings, SR. A high ratio of dietary animal to vegetable protein increases the rate of bone loss and the risk of fracture in postmenopausal women. Study of Osteoporotic Fractures Research Group. Am J Clin Nutr. 2001. 73:118-22. doi:10.1093/ajcn/73.1.118	Intervention/Exposure
97	Leung, SS, Lee, RH, Sung, RY, Luo, HY, Kam, CW, Yuen, MP, Hjelm, M, Lee, SH. Growth and nutrition of Chinese vegetarian children in Hong Kong. J Paediatr Child Health. 2001. 37:247-53. doi:10.1046/j.1440-1754.2001.00647.x	Publication Date

	Citation	Rationale
98	Promislow, JH, Goodman-Gruen, D, Slymen, DJ, Barrett-Connor, E. Protein consumption and bone mineral density in the elderly: the Rancho Bernardo Study. Am J Epidemiol. 2002. 155:636-44. doi:10.1093/aje/155.7.636	Intervention/Exposure
99	Skov, AR, Haulrik, N, Toubro, S, Molgaard, C, Astrup, A. Effect of protein intake on bone mineralization during weight loss: a 6-month trial. Obes Res. 2002. 10:432-8. doi:10.1038/oby.2002.60	Intervention/Exposure
100	Dawson-Hughes, B, Harris, SS. Calcium intake influences the association of protein intake with rates of bone loss in elderly men and women. Am J Clin Nutr. 2002. 75:773-9. doi:10.1093/ajcn/75.4.773	Intervention/Exposure
101	Tucker, KL, Chen, H, Hannan, MT, Cupples, LA, Wilson, PW, Felson, D, Kiel, DP. Bone mineral density and dietary patterns in older adults: the Framingham Osteoporosis Study. Am J Clin Nutr. 2002. 76:245-52. doi:10.1093/ajcn/76.1.245	Publication Date
102	Reddy, ST, Wang, CY, Sakhaee, K, Brinkley, L, Pak, CY. Effect of low-carbohydrate high-protein diets on acid-base balance, stone-forming propensity, and calcium metabolism. Am J Kidney Dis. 2002. 40:265-74. doi:10.1053/ajkd.2002.34504	Intervention/Exposure
103	Roughead, ZK, Johnson, LK, Lykken, GI, Hunt, JR. Controlled high meat diets do not affect calcium retention or indices of bone status in healthy postmenopausal women. J Nutr. 2003. 133:1020-6. doi:10.1093/jn/133.4.1020	Intervention/Exposure; Publication Date
104	Harrington, M, Bennett, T, Jakobsen, J, Ovesen, L, Brot, C, Flynn, A, Cashman, KD. The effect of a high-protein, high-sodium diet on calcium and bone metabolism in postmenopausal women and its interaction with vitamin D receptor genotype. Br J Nutr. 2004. 91:41-51. doi:10.1079/bjn20031016	Intervention/Exposure
105	Bowen, J, Noakes, M, Clifton, PM. A high dairy protein, high-calcium diet minimizes bone turnover in overweight adults during weight loss. J Nutr. 2004. 134:568-73. doi:10.1093/jn/134.3.568	Intervention/Exposure; Publication Date
106	Ince, BA, Anderson, EJ, Neer, RM. Lowering dietary protein to U.S. Recommended dietary allowance levels reduces urinary calcium excretion and bone resorption in young women. J Clin Endocrinol Metab. 2004. 89:3801-7. doi:10.1210/jc.2003-032016	Intervention/Exposure
107	Greene, DA, Naughton, GA, Briody, JN, Kemp, A, Woodhead, H, Farpour-Lambert, N. Musculoskeletal health in elite male adolescent middle-distance runners. J Sci Med Sport. 2004. 7:373-83.	Intervention/Exposure
108	Harrington, M, Bennett, T, Jakobsen, J, Ovesen, L, Brot, C, Flynn, A, Cashman, KD. Effect of a high-protein, high-salt diet on calcium and bone metabolism in postmenopausal women stratified by hormone replacement therapy use. Eur J Clin Nutr. 2004. 58:1436-9. doi:10.1038/sj.ejcn.1601983	Intervention/Exposure

	Citation	Rationale
109	Roughead, ZK, Hunt, JR, Johnson, LK, Badger, TM, Lykken, GI. Controlled substitution of soy protein for meat protein: effects on calcium retention, bone, and cardiovascular health indices in postmenopausal women. J Clin Endocrinol Metab. 2005. 90:181-9. doi:10.1210/jc.2004-0393	Intervention/Exposure; Publication Date
110	Kerstetter, JE, O'Brien, KO, Caseria, DM, Wall, DE, Insogna, KL. The impact of dietary protein on calcium absorption and kinetic measures of bone turnover in women. J Clin Endocrinol Metab. 2005. 90:26-31. doi:10.1210/jc.2004-0179	Intervention/Exposure
111	Luscombe-Marsh, ND, Noakes, M, Wittert, GA, Keogh, JB, Foster, P, Clifton, PM. Carbohydrate-restricted diets high in either monounsaturated fat or protein are equally effective at promoting fat loss and improving blood lipids. Am J Clin Nutr. 2005. 81:762-72. doi:10.1093/ajcn/81.4.762	Intervention/Exposure
112	Bounds, W, Skinner, J, Carruth, BR, Ziegler, P. The relationship of dietary and lifestyle factors to bone mineral indexes in children. J Am Diet Assoc. 2005. 105:735-41. doi:10.1016/j.jada.2005.02.046	Intervention/Exposure
113	Devine, A, Dick, IM, Islam, AF, Dhaliwal, SS, Prince, RL. Protein consumption is an important predictor of lower limb bone mass in elderly women. Am J Clin Nutr. 2005. 81:1423-8. doi:10.1093/ajcn/81.6.1423	Intervention/Exposure
114	Weikert, C, Walter, D, Hoffmann, K, Kroke, A, Bergmann, MM, Boeing, H. The relation between dietary protein, calcium and bone health in women: results from the EPIC-Potsdam cohort. Ann Nutr Metab. 2005. 49:312-8. doi:10.1159/000087335	Intervention/Exposure; Publication Date
115	Zhang, X, Shu, XO, Li, H, Yang, G, Li, Q, Gao, YT, Zheng, W. Prospective cohort study of soy food consumption and risk of bone fracture among postmenopausal women. Arch Intern Med. 2005. 165:1890-5. doi:10.1001/archinte.165.16.1890	Intervention/Exposure
116	Alexy, U, Remer, T, Manz, F, Neu, CM, Schoenau, E. Long-term protein intake and dietary potential renal acid load are associated with bone modeling and remodeling at the proximal radius in healthy children. Am J Clin Nutr. 2005. 82:1107-14. doi:10.1093/ajcn/82.5.1107	Intervention/Exposure
117	Carter, JD, Vasey, FB, Valeriano, J. The effect of a low-carbohydrate diet on bone turnover. Osteoporos Int. 2006. 17:1398-403. doi:10.1007/s00198-006-0134-x	Intervention/Exposure
118	Jajoo, R, Song, L, Rasmussen, H, Harris, SS, Dawson-Hughes, B. Dietary acid-base balance, bone resorption, and calcium excretion. J Am Coll Nutr. 2006. 25:224-30. doi:10.1080/07315724.2006.10719536	Intervention/Exposure; Publication Date
119	Swanenburg, J, de Bruin, ED, Stauffacher, M, Mulder, T, Uebelhart, D. Effects of exercise and nutrition on postural balance and risk of falling in elderly people with decreased bone mineral density: randomized controlled trial pilot study. Clin Rehabil. 2007. 21:523-34. doi:10.1177/0269215507075206	Intervention/Exposure

	Citation	Rationale
120	Vatanparast, H, Bailey, DA, Baxter-Jones, AD, Whiting, SJ. The effects of dietary protein on bone mineral mass in young adults may be modulated by adolescent calcium intake. J Nutr. 2007. 137:2674-9. doi:10.1093/jn/137.12.2674	Intervention/Exposure
121	Thorpe, M, Mojtahedi, MC, Chapman-Novakofski, K, McAuley, E, Evans, EM. A positive association of lumbar spine bone mineral density with dietary protein is suppressed by a negative association with protein sulfur. J Nutr. 2008. 138:80-5. doi:10.1093/jn/138.1.80	Intervention/Exposure
122	Thorpe, DL, Knutsen, SF, Beeson, WL, Rajaram, S, Fraser, GE. Effects of meat consumption and vegetarian diet on risk of wrist fracture over 25 years in a cohort of peri- and postmenopausal women. Public Health Nutr. 2008. 11:564-72. doi:10.1017/s1368980007000808	Publication Date
123	Thorpe, MP, Jacobson, EH, Layman, DK, He, X, Kris-Etherton, PM, Evans, EM. A diet high in protein, dairy, and calcium attenuates bone loss over twelve months of weight loss and maintenance relative to a conventional high-carbohydrate diet in adults. J Nutr. 2008. 138:1096-100. doi:10.1093/jn/138.6.1096	Publication Date
124	Kontogianni, MD, Melistas, L, Yannakoulia, M, Malagaris, I, Panagiotakos, DB, Yiannakouris, N. Association between dietary patterns and indices of bone mass in a sample of Mediterranean women. Nutrition. 2009. 25:165-71. doi:10.1016/j.nut.2008.07.019	Publication Date
125	McTiernan, A, Wactawski-Wende, J, Wu, L, Rodabough, RJ, Watts, NB, Tylavsky, F, Freeman, R, Hendrix, S, Jackson, R. Low-fat, increased fruit, vegetable, and grain dietary pattern, fractures, and bone mineral density: the Women's Health Initiative Dietary Modification Trial. Am J Clin Nutr. 2009. 89:1864-76. doi:10.3945/ajcn.2008.26956	Publication Date
126	Bullo, M, Amigo-Correig, P, Marquez-Sandoval, F, Babio, N, Martinez-Gonzalez, MA, Estruch, R, Basora, J, Sola, R, Salas-Salvado, J. Mediterranean diet and high dietary acid load associated with mixed nuts: effect on bone metabolism in elderly subjects. J Am Geriatr Soc. 2009. 57:1789-98. doi:10.1111/j.1532-5415.2009.02481.x	Publication Date
127	Nowson, CA, Patchett, A, Wattanapenpaiboon, N. The effects of a low-sodium base-producing diet including red meat compared with a high-carbohydrate, low-fat diet on bone turnover markers in women aged 45-75 years. Br J Nutr. 2009. 102:1161-70. doi:10.1017/s0007114509371731	Publication Date
128	Meng, X, Zhu, K, Devine, A, Kerr, DA, Binns, CW, Prince, RL. A 5-year cohort study of the effects of high protein intake on lean mass and BMC in elderly postmenopausal women. J Bone Miner Res. 2009. 24:1827-34. doi:10.1359/jbmr.090513	Intervention/Exposure

	Citation	Rationale
129	Chan, R, Woo, J, Lau, W, Leung, J, Xu, L, Zhao, X, Yu, W, Lau, E, Pocock, N. Effects of lifestyle and diet on bone health in young adult Chinese women living in Hong Kong and Beijing. Food Nutr Bull. 2009. 30:370-8. doi:10.1177/156482650903000408	Intervention/Exposure
130	Zhang, Q, Ma, G, Greenfield, H, Zhu, K, Du, X, Foo, LH, Hu, X, Fraser, DR. The association between dietary protein intake and bone mass accretion in pubertal girls with low calcium intakes. Br J Nutr. 2010. 103:714-23. doi:10.1017/s0007114509992303	Intervention/Exposure
131	Marcason, W. What is the effect of a high-protein diet on bone health? J Am Diet Assoc. 2010. 110:812. doi:10.1016/j.jada.2010.03.034	Intervention/Exposure; Publication Date
132	Beasley, JM, Ichikawa, LE, Ange, BA, Spangler, L, LaCroix, AZ, Ott, SM, Scholes, D. Is protein intake associated with bone mineral density in young women? Am J Clin Nutr. 2010. 91:1311-6. doi:10.3945/ajcn.2009.28728	Study Design; Intervention/Exposure
133	Dorgan, JF, Liu, L, Klifa, C, Hylton, N, Shepherd, JA, Stanczyk, FZ, Snetselaar, LG, Van Horn, L, Stevens, VJ, Robson, A, Kwiterovich, PO, Jr, Lasser, NL, Himes, JH, Pettee Gabriel, K, Kriska, A, Ruder, EH, Fang, CY, Barton, BA. Adolescent diet and subsequent serum hormones, breast density, and bone mineral density in young women: results of the Dietary Intervention Study in Children follow-up study. Cancer Epidemiol Biomarkers Prev. 2010. 19:1545-56. doi:10.1158/1055-9965.Epi-09-1259	Intervention/Exposure; Publication Date
134	Nieves, JW, Melsop, K, Curtis, M, Kelsey, JL, Bachrach, LK, Greendale, G, Sowers, MF, Sainani, KL. Nutritional factors that influence change in bone density and stress fracture risk among young female cross-country runners. Pm r. 2010. 2:740-50; quiz 794. doi:10.1016/j.pmrj.2010.04.020	Publication Date
135	Wosje, KS, Khoury, PR, Claytor, RP, Copeland, KA, Hornung, RW, Daniels, SR, Kalkwarf, HJ. Dietary patterns associated with fat and bone mass in young children. Am J Clin Nutr. 2010. 92:294-303. doi:10.3945/ajcn.2009.28925	Publication Date
136	Foster, GD, Wyatt, HR, Hill, JO, Makris, AP, Rosenbaum, DL, Brill, C, Stein, RI, Mohammed, BS, Miller, B, Rader, DJ, Zemel, B, Wadden, TA, Tenhave, T, Newcomb, CW, Klein, S. Weight and metabolic outcomes after 2 years on a low-carbohydrate versus low-fat diet: a randomized trial. Ann Intern Med. 2010. 153:147-57. doi:10.7326/0003-4819-153-3-201008030-00005	Intervention/Exposure; Publication Date
137	Campbell, WW, Tang, M. Protein intake, weight loss, and bone mineral density in postmenopausal women. J Gerontol A Biol Sci Med Sci. 2010. 65:1115-22. doi:10.1093/gerona/glq083	Intervention/Exposure; Publication Date

	Citation	Rationale
138	Sahni, S, Cupples, LA, McLean, RR, Tucker, KL, Broe, KE, Kiel, DP, Hannan, MT. Protective effect of high protein and calcium intake on the risk of hip fracture in the Framingham offspring cohort. J Bone Miner Res. 2010. 25:2770-6. doi:10.1002/jbmr.194	Intervention/Exposure; Publication Date
139	Li, Z, Treyzon, L, Chen, S, Yan, E, Thames, G, Carpenter, CL. Protein-enriched meal replacements do not adversely affect liver, kidney or bone density: an outpatient randomized controlled trial. Nutr J. 2010. 9:72. doi:10.1186/1475-2891-9-72	Intervention/Exposure; Publication Date
140	Misra, D, Berry, SD, Broe, KE, McLean, RR, Cupples, LA, Tucker, KL, Kiel, DP, Hannan, MT. Does dietary protein reduce hip fracture risk in elders? The Framingham Osteoporosis Study. Osteoporos Int. 2011. 22:345-9. doi:10.1007/s00198-010-1179-4	Intervention/Exposure; Publication Date
141	Cao, JJ, Johnson, LK, Hunt, JR. A diet high in meat protein and potential renal acid load increases fractional calcium absorption and urinary calcium excretion without affecting markers of bone resorption or formation in postmenopausal women. J Nutr. 2011. 141:391-7. doi:10.3945/jn.110.129361	Publication Date
142	Nutrient-rich diet linked to reduction in fracture risk. Eating fruits, vegetables and whole grains is deemed key to bone health. Duke Med Health News. 2011. 17:7.	Publication Date; Publication Status
143	Pedone, C, Napoli, N, Pozzilli, P, Rossi, FF, Lauretani, F, Bandinelli, S, Ferrucci, L, Antonelli-Incalzi, R. Dietary pattern and bone density changes in elderly women: a longitudinal study. J Am Coll Nutr. 2011. 30:149-54. doi:10.1080/07315724.2011.10719954	Publication Date
144	Sukumar, D, Ambia-Sobhan, H, Zurfluh, R, Schlussel, Y, Stahl, TJ, Gordon, CL, Shapses, SA. Areal and volumetric bone mineral density and geometry at two levels of protein intake during caloric restriction: a randomized, controlled trial. J Bone Miner Res. 2011. 26:1339-48. doi:10.1002/jbmr.318	Intervention/Exposure; Publication Date
145	Fairweather-Tait, SJ, Skinner, J, Guile, GR, Cassidy, A, Spector, TD, MacGregor, AJ. Diet and bone mineral density study in postmenopausal women from the TwinsUK registry shows a negative association with a traditional English dietary pattern and a positive association with wine. Am J Clin Nutr. 2011. 94:1371-5. doi:10.3945/ajcn.111.019992	Publication Date
146	Josse, AR, Atkinson, SA, Tarnopolsky, MA, Phillips, SM. Diets higher in dairy foods and dietary protein support bone health during diet- and exercise-induced weight loss in overweight and obese premenopausal women. J Clin Endocrinol Metab. 2012. 97:251-60. doi:10.1210/jc.2011-2165	Publication Date
147	Ho-Pham, LT, Vu, BQ, Lai, TQ, Nguyen, ND, Nguyen, TV. Vegetarianism, bone loss, fracture and vitamin D: a longitudinal study in Asian vegans and non-vegans. Eur J Clin Nutr. 2012. 66:75-82. doi:10.1038/ejcn.2011.131	Publication Date

	Citation	Rationale
148	Fernandez-Real, JM, Bullo, M, Moreno-Navarrete, JM, Ricart, W, Ros, E, Estruch, R, Salas-Salvado, J. A Mediterranean diet enriched with olive oil is associated with higher serum total osteocalcin levels in elderly men at high cardiovascular risk. J Clin Endocrinol Metab. 2012. 97:3792-8. doi:10.1210/jc.2012-2221	Publication Date
149	Rivas, A, Romero, A, Mariscal-Arcas, M, Monteagudo, C, Feriche, B, Lorenzo, ML, Olea, F. Mediterranean diet and bone mineral density in two age groups of women. Int J Food Sci Nutr. 2013. 64:155-61. doi:10.3109/09637486.2012.718743	Publication Date
150	Oh, SM, Kim, HC, Rhee, Y, Park, SJ, Lee, HJ, Suh, I, Feskanich, D. Dietary protein in relation to bone stiffness index and fat-free mass in a population consuming relatively low protein diets. J Bone Miner Metab. 2013. 31:433-41. doi:10.1007/s00774-013-0427-z	Intervention/Exposure; Publication Date
151	Tang, M, Leidy, HJ, Campbell, WW. Regional, but not total, body composition changes in overweight and obese adults consuming a higher protein, energy-restricted diet are sex specific. Nutr Res. 2013. 33:629-35. doi:10.1016/j.nutres.2013.05.012	Intervention/Exposure; Publication Date
152	High fat levels in muscles, liver, blood, and bone marrow linked to poor bone health.But a healthy weight and healthy diet can help stave off bone loss, osteoporosis. Duke Med Health News. 2013. 19:4-5.	Publication Date; Publication Status
153	Jesudason, D, Nordin, BC, Keogh, J, Clifton, P. Comparison of 2 weight-loss diets of different protein content on bone health: a randomized trial. Am J Clin Nutr. 2013. 98:1343-52. doi:10.3945/ajcn.113.058586	Intervention/Exposure; Publication Date
154	Okubo, H, Sasaki, S, Horiguchi, H, Oguma, E, Miyamoto, K, Hosoi, Y, Kim, MK, Kayama, F. Dietary patterns associated with bone mineral density in premenopausal Japanese farmwomen. American Journal of Clinical Nutrition. 2006. 83:1185-1192.	Outcome; Publication Date
155	Does protein benefit bone density? Health news (Waltham, Mass.). 2002. 8:9.	Publication Status
156	Sellmeyer, DE, Stone, KL, Sebastian, A, Cummings, SR. A high ratio of dietary animal to vegetable protein increases the rate of bone loss and the risk of fracture in postmenopausal women. American Journal of Clinical Nutrition. 2001. 73:118-122.	Publication Date